

REMARKS

Claims 19-41, 43-50 and 52-54 are presented for further examination.

The indications of allowability are appreciated.

Amendments:

The features of claim 42, indicated to be allowable, have been added to independent claim 19 from which it depended, with the addition of the term “substantially” before the term “aligned.” Claim 42 is canceled, and the dependency of claim 43 has been changed from 42 to 19. Claims 43 and 44 are also amended to include a similar use of the term “substantially.”

Independent claim 27 is amended to clarify features of integral sidewalls of a shield recited in those claims. Specifically, claim 27 is amended to specify a first shield disposed at a first end of the GMR spin valve stack and a second shield disposed at a second end of the GMR spin valve stack, and to specify that the second shield is formed to include integral side shields that extend toward the first shield. An example of such a structure is shown in Figure 8 of the application. Claim 27 is further amended to specify that the integral side shields extend beyond at least a portion of the insulated layer of permanent magnet material, an example of which is shown in Figure 8 of the application.

Claim 38 is amended to specify a first and second shield, and to specify that the integral side shields substantially enclose at least a portion of a free layer of a GMR spin valve stack. Such structure is also shown in Figure 8. Claims 31, 33, 48, 49, 50, 53 and 54 are amended to use the term “second shield” consistently with claims 27 and 38. Claim 38 is further amended to incorporate features previously recited in claim 51. Specifically, claim 38 is amended to state that the insulated layer of permanent magnetic material comprises a first insulating layer abutting a lower portion of the GMR spin valve stack that includes the pinned layer and an electrode contacting the pinned layer. References to the first insulating layer in claims 50 and 53 are amended to be consistent with the amendment to claim 38.

No new matter is added.

Claim Rejections:

Applicants respond to the rejections as follows.

Claim 19 and its dependent claims

Claim 19 has been amended to incorporate the features of claim 42, which was indicated to be allowable. Therefore claim 19 and its dependent claims 20-26, 37, 39-41 and 43-44 are believed to be allowable.

Claim 38 and its dependent claims

Claim 38 has been amended to incorporate features of claim 51, which was indicated to be allowable. Therefore claim 38 and its dependent claims 50 and 52-54 are believed to be allowable.

Claim 27 and its dependent claims

Claims 27-29, 33-36, 45 and 47 were rejected under 35 U.S.C. 103(a) as being unpatentable over Seyama (U.S. 6,801,413) in view of Fontana (U.S. 6,680,832). The rejections are respectfully traversed in view of the amendments to claim 27.

Claim 27 describes a structure such as that of Figure 8 of the application, in which a GMR spin valve stack having a pinned layer 126 and a free layer 128 has a first shield 122 disposed at a first end and a second shield disposed at a second end. The second shield includes integral side shields 140, 142 that extend toward the first shield 122. An insulated layer of permanent magnet material 132, 134, 136 is disposed between the shields and abuts the free layer 128. The integral side shields 140, 142 extend beyond at least a portion of the insulated layer of permanent magnet material. The combination of Seyama and Fontana teaches away from such a structure.

Fontana (Fig. 2) shows a GMR spin valve stack having a free layer 38 and a pinned layer 34, and a shield 13 with side shields that surround the GMR spin valve stack. In Fontana there is no insulated layer of permanent magnet material.

Seyama (Fig. 13A) shows a structure that has a GMR spin valve stack 23, an insulated layer of permanent magnet material 56 that abuts the GMR spin valve stack 23, and first and

second shields 22, 26. Seyama teaches that in this structure, the second shield 26 is structured so that its sides extend away from the first shield 22, the spin valve stack 23 and the layer of permanent magnet material 56. Therefore Seyama teaches away from the use of Fontana's second shield that extends toward a first shield when an insulated layer of permanent magnet material 56 is placed in an abutting relationship next to a spin valve stack 23. In contrast, claim 27 requires that integral side shields of a second shield extend toward the first shield, to beyond at least a portion of the insulated layer of permanent magnet material. One following the teachings of Fontana and Seyama would not be led to such a structure, but rather would be led away from such a structure by comparing the shield structure used by Seyama to the shield structure used by Fontana and recognizing that Seyama does not use enclosing side shields due to the presence of the abutting insulated layer of permanent magnet material. Therefore the structure of claim 27 and its dependent claims 28-36 and 45-49 is not obvious from the combined teachings of Seyama and Fontana.

Conclusion:

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 50-0872. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 50-0872.

If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 50-0872.

Respectfully submitted,

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